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How and Where to Collect Spiders

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The best means of killing and preserving spiders is to drop them alive into 95 per cent grain alcohol (190 proof). Concentrations as low as 70 per cent may be used, although the higher percentages are better, especially for collecting, when body fluids dilute the alcohol to quite an extent. Denatured alcohol, wood alcohol, or formalin, in that order of preference, may be used, but *only* if grain alcohol is unobtainable. These alcohols and formalin are unsuitable as they are disagreeable to handle and are poor preservatives. When on a collecting trip, the alcohol need not be changed before the spiders are brought back to the laboratory for permanent storage, unless the vials are more than half full of spiders. The body fluids will not dilute the alcohol enough to affect it greatly. For transporting, the vials should be completely filled with alcohol so that the spiders will not be broken sloshing back and forth. A crumpled *piece* of tissue paper or other resilient material may be placed in the bottle to prevent the spiders from being broken. Do not use cotton as it may act more like a piston and grind the spiders to bits. For shipping, vials may be wrapped individually with a couple of layers of paper. When placed in a wooden box or other container lined with cotton no breakage should occur. Homeopathic vials, shell vials, or any larger bottle may be used for collecting. Each separately collected group of spiders should be kept in a separate vial with the *exact* locality, date, and collector's name. Additional notes as to type of web, habitat, or anything of interest should be kept in a notebook with a number corresponding to one on the vial label. Labels inserted into the vials may be written with a soft pencil on a piece of writing paper or with India ink on a good grade of bond paper. For field labels, pencil and ordinary paper is most efficient.

Spiders may be caught by using one's fingers, a pair of forceps, or a dry shell vial. Fingers are as good as anything if the spider is not too fast or small. Forceps are to be used with discretion as a spider caught by the leg often leaves one holding the leg. If used with care, however, they are a decided asset in extracting spiders from cracks or crevices. I recommend the use of the dry vial for most collecting, as it can easily be placed over the spider. When the spider crawls up into the vial it may be lifted and the spider shaken into the alcohol.

The most conspicuous spiders are those which stretch their beautiful symmetrical orb-webs between trees or shrubs. They can be caught easily in the following manner. Place a bottle of alcohol as close to the spider as possible and directly beneath it. Then touch the spider lightly and it will drop into the alcohol. If the spider is not in plain sight, it may be found hidden beneath a leaf in an upper corner of the

web at the end of one of the guy-wire threads. On and beneath bark, in rotten logs and stumps, and beneath stones one can collect spiders not to be found elsewhere. This is especially true of mountain tops, beaches, and other exposed places. Many of the spiders found where animals are scarce are apt to be rare or unique. Along the beach one may find spiders under or on bushes or grass, or beneath driftwood. They may also be shaken from trees onto a cloth by beating the trees with a heavy stick. This means is especially effective in the tropics, or where the woods are very thick. Night hunting with a headlamp to shine the spider's *eyes*, as in frog collecting, is a very efficient way of finding night roamer, such as the wolf spiders.

Burrowing spiders can occasionally be caught by means of a straw thrust down into their burrow. They may bite into this and can then be pulled out quickly before they are able to let go. A handful of dirt or sand poured into the burrow will bring them to the surface sometimes. Their retreat may then be cut off by jabbing a trowel at an angle into the burrow behind them. Usually, however, they must be dug out. The best method is to insert a straw or grass stem into the hole as far as it will go so that the tube will not be so easily lost or obscured. A hole is then dug close beside the burrow and the side wall broken away with forceps or a twig, exposing it to the bottom. At night, using a headlight, one may find many of these burrowers running *free* on the surface. Those still in their burrows can be approached much closer before they bob back out of sight, and a short wait will reward one with the appearance of the spider again when its retreat can be cut off by means of the trowel.

Innumerable small spiders, which are usually the rare and more interesting forms, may be found by sifting leaf mold or sweeping the vegetation with a net. For sifting, a large cloth, preferably gray to prevent glare, is spread on the ground. The sifter can be made by using a canvas pail with half-inch mesh wire screen for the bottom. Moss or leaf mold is sifted through the screen onto the cloth. Except in the tropics one can usually pick up the moss or leaves with safety. In the warmer parts of the world, however, it is not a good policy to thrust one's hand into an untried spot. A potato hoe or trowel is a very helpful adjunct to collecting in this manner. This method retains the larger pieces of debris and allows the spiders to drop through and be picked up as they scurry for cover across the cloth. A simpler, though just as effective, method is the placing of leaf mold on a canvas and gradually removing the leaves and large pieces, leaving the spiders. Unless the right spot is chosen, this method may be rather discouraging at first. The leaf mold should be damp but not too wet nor too dry. Loose moss will

have a larger fauna than tight moss. The forest floor with its leaf mold with white mycelia is a very good place for spiders. The fauna of hillsides will vary considerably, a sunny southern slope harboring different spiders than a darker, colder, northern slope. One of the richest habitats for collecting is in the sphagnum moss of bogs. Here I have found representatives of most of the families of the region as well as several new species and other rare ones.

For more refined technique in getting these leaf mold spiders, the Berlese funnel should be used. This is a method whereby the material is slowly dried from the top downward. To keep in the moist part of the moss, the spiders move downward until they finally drop into an alcohol bottle at the base of the funnel. Noxious odors may also be used effectively in driving the animals out of the moss. For more detailed information on this technique see the Entomological News for February, 1906.

Sweeping is also a very effective collecting method. An insect net, or better still a beating net of heavy cloth, should be used. A meadow or other grassy or weedy area may thus be covered by sweeping and the specimens obtained spread out on a cloth or collected directly from the net with wet forceps or a dry shell vial. This method will produce as many spiders, if not more, than any other.

Some of the groups of spiders which one might expect to collect in the Chicago Region using these different techniques are the following. Night collecting with the headlight should yield many wolf spiders (*Lycosidae*) and some nursery-web spiders (*Pisauridae*). Burrowing spiders are almost exclusively wolf spiders. A sharp eve to the ground and bushes will discover more wolf spiders and the larger web builders of the families *Argiopidae*, *Linyphiidae*, *Theridiidae*, and *Agelenidae*. Spiders of the mosses and leaves of the forest floor will include most of the minute spiders of the family *Micryphantidae*, as well as the fast-running *Gnaphosidae*, the light-colored *Clubionidae*, and the jumping spiders (*Salticidae*). Many immature of all families will also be found here. Sweeping will yield a great variety, including almost all the families but with the crab spiders (*Thomisidae*), the orb weavers (*Argiopidae*), and the jumping spiders in the majority. Aquatic localities are well represented by the wolf spiders and the diving nursery-web pisaurids, which are our largest spiders in the north. Bogs yield an innumerable variety of small spiders of all families, many of them rare. Forested localities, meadows and areas where there are some means of support for the webs will have most of the web builders.